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AROUSAL, DISTRACTION, AND ATTITUDE CHANGE

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

OCTOBER, 1966

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Arousal, Distraction, and Attitude Change", submitted by David Howard Rehill in partial fulfilment of the requirements for the degree of Master of Arts.

Abstract

It has previously been suggested that cognitive dissonance results when an individual is confronted with a persuasive communication advocating a position differing from his own. It was further suggested that there are two ways in which the individual reduces this dissonance: by reducing the validity of the communication or derogating the speaker by counter-arguing the points made; or by changing his own position to one closer to that advocated by the communication.

It has recently been demonstrated that if an individual is distracted while listening to the communication, he is not able to counterargue effectively and as a result, has to change his own position in order to reduce the dissonance. In the present study, it was suggested that this "distraction effect" decreases with increases in arousal. This hypothesis was partially based on the work done relating arousal to cue utilization.

To test this hypothesis, three groups of subjects were manipulated to low, medium, and high arousal. They were then given a persuasive communication to read, advocating the use of T.V. as a teaching aid in high schools, a position opposing their own. While they read the communication, an audio distraction, consisting of several sound effects was played. Several measures were taken so that the degree of distraction, attention given to the communication, and attitude change could be inferred.

The results fully supported the hypothesis: as arousal was increased, concentration on the communication increased, distraction decreased, and the degree of attitude change decreased.

Acknowledgements

I wish to express a special thanks to my supervisor, Dr. B. Rule, who encouraged and helped me in the writing of this thesis. I also wish to extend a sincere thanks to the other members of my committee, Drs. R. Walley, K. V. Wilson, and D. Larsen, for their helpful comments and discussions. Also a thank you to Mary Rose Robertson for her "typing" hours.

David Howard Rehill

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Introduction

In the situation where an individual is faced with a communication expressing an opinion differing from his own, attitude change in the direction of that advocated by the communication may result. This process is referred to as persuasion. Persuasion has long been of practical and theoretical interest; many studies have attempted to discover the mechanics of the process.

One theoretical approach to an understanding of persuasion has been advanced by Festinger in his theory of Cognitive Dissonance (1957). A change in attitude is viewed as a method of dissonance reduction. According to Festinger, a person experiences dissonance, a motivational tension, when he has cognitions among which there are one or more dissonant relationships. A dissonant relationship exists between two cognitive elements when a person possesses one which follows from the obverse of another. In the situation where an individual is faced with a persuasive communication which argues for a position differing from his own, dissonance is created between the opinion of the reader and his knowledge of the arguments favoring the contrary view. Since dissonance is tensional, the subject is motivated to reduce it, and he does so in the most economical way. Brehm & Cohen (1962) state:

When a person experiences dissonance, he will tend to change those dissonant cognitive elements that are least resistant to change. Hence dissonance aroused in connection with a commitment is likely to be reduced by change in elements other than those involved in the commitment. If a person chooses A of two attractive alternatives, A and B, he is not likely to reduce the resulting dissonance by saying that his choice was wrong and that he should have chosen B.

Dissonance theory predicts that an individual, committed to an attitude, changes that attitude to reduce dissonance only as a last resort; he is more likely to change his cognitions of the communication advocating the other position. By dismissing the communication as non-valid, the individual reduces the dissonance. In order to derogate the communication, the individual committed to his own position matches his position against that advocated by the communication: he counter-argues. Since there are two alternatives available to reduce dissonance, the individual who counterargues successfully does not change his opinion as much as one who, for some reason, is not able to counterargue successfully. An inverse relationship between counterargument and attitude change has been demonstrated by Lumsdaine & Janis (1953); Papageorgiis & McGuire (1961); and Manis & Blake (1963).

Recently, several studies have attempted to prevent or reduce effective counterargument, in order to increase persuasibility. One type of experiment, the one this paper is concerned with, is the distraction experiment. It was hypothesized by Festinger and Maccoby (1964), that an individual who is distracted during presentation of a persuasive communication, is more susceptible to attitude change than one who is not distracted. The distraction prevents him from counterarguing effectively.

An early study by Festinger & Allyn (1961) inadvertently lent support to this hypothesis. This study demonstrated that forewarning a subject of the content of the communication has the effect of reducing the attitude change. The authors interpreted this result by suggesting that when persons are forewarned that their opinion is to be attacked, they are better able to

marshal their defences and, hence, are more successful in rejecting the communication.

In a criticism of this study, Festinger and Maccoby (1964) pointed out that both the experimental and control groups were actually forewarned; thus, another interpretation was needed. They noted that the group which was supposedly not forewarned was asked to pay attention to the speaker's personality; whereas, the forewarned group was instructed only to pay attention to the communication. A good deal of the attention of the "non-forewarned" group was diverted or distracted from the communication. They were less able to actively counterargue while they were listening; they were distracted from the task of counterarguing. Since they were not able to reduce the dissonance by derogating the communication, they had to change their own opinions. With such an interpretation, the study supports the distraction hypothesis.

To test the hypothesis, Festinger and Maccoby devised a persuasive communication strongly attacking a specified position and presented it to two groups of subjects who were committed to an opinion opposed to that communicated. The attention of one group was focused on an audio-visual communication, while the attention of the experimental group was distracted from the audio communication by a completely irrelevant visual presentation. Of three repetitions of the procedure, two provided data supporting the hypothesis: the distracted group demonstrated more attitude change than the non-distracted group.

Data consistent with the distraction hypothesis, although not significant, were presented by Freedman & Sears (1965). They also compared the

attitude change, resulting from a persuasive communication, of a distracted and a non-distracted group. The attention of the distracted group was focused on the personality of the speaker, while the attention of the non-distracted group was focused on the communication.

A study of "Facilitating Effects of 'Eating-While-Reading' on the Responsiveness to Persuasive Communications" (Janis, Kay, & Kirschner, 1965), may also be interpreted as support for the distraction hypothesis. The authors found that subjects who were eating while reading a persuasive communication, demonstrated a greater change in attitude than subjects who were not eating. It is suggested that the subjects who were eating, were simply distracted.

Failure to find significant data in the Freedman & Sears study and in one repetition of the Festinger, Maccoby study may be due to a common methodological consideration. The attitudes which both sets of authors attempted to manipulate were extreme so as to insure that the subjects would be strongly committed to their position. Festinger and Maccoby attempted to change the favorable attitudes of fraternity members toward college fraternities; while Freedman and Sears attempted to change the favorable attitudes of teenagers toward teenage drivers. Theoretically, they were justified in their choice since it has been repeatedly demonstrated that the amount of dissonance, thus resulting attitude change, depends upon the commitment of the individual (Cohen & Jones, 1959; Rosenbaum & Franc, 1960; and Freedman & Steinbruner, 1964). Both Freedman & Sears' and Festinger & Maccoby's choice of topic also provided a maximal difference between the subject's attitude and that communicated. It has

been shown that a maximal difference produces more dissonance, thus more attitude change (Hovland & Pritzker, 1957; Rosenbaum & Franc, 1960; Zimbardo, 1960; and Aronson, Turner & Carlsmith, 1963). In general the choice of topics was intended to produce maximal dissonance; however, it appears by achieving this goal, both Freedman & Sears and Festinger & Maccoby inadvertently reduced the effect of the distraction. It seems reasonable to assume that individuals who hold extreme attitudes are often placed in situations where they are called upon to defend their position, particularly when the topic is of a highly controversial nature. It is likely that such an individual has heard most of the possible arguments against his position, and as a result enters the experimental situation with a supply of ready-made counter-arguments. The utilization of these counter-arguments would be rapid, requiring much less time than for an individual attempting to counterargue material which was relatively new to him. Obviously, a distraction would be more of a hindrance in the latter situation. The Festinger & Maccoby study supports such an interpretation. They repeated their procedure three times, using subjects drawn from three different campuses. They failed to get significant results when using fraternity members from a campus in which fraternities were under constant attack. Their most significant results were obtained from a sample of fraternity members drawn from a campus in which the fraternities were not under any such attack or pressure.

Freedman and Sears may further be criticised for their choice of distraction stimuli. They distracted their subjects by orienting them toward the speaker's personality, rather than toward the content of the

speech. It is likely that the "distracted" group was not actually distracted, since they may have paid particular attention to the speech in order to use it as a factor in their judgment of the speaker's personality. The authors themselves admit that their distraction was not as good as the irrelevant video presentation used by Festinger and Maccoby.

A later study by Rosenblatt (1965) was intended to test the hypothesis that there is a curvilinear relationship between distraction and persuasion: that moderate distraction produces greater attitude change than no distraction or strong distraction. This study is particularly important since Rosenblatt inadvertently handled the problem of pre-established counter-arguments. The attitude which he attempted to manipulate was of a less controversial nature than those used in the studies previously discussed. As a result, his subjects were less likely to have pre-established counter-arguments. Rosenblatt attempted to change the favorable attitudes of his subjects toward the use of chest X-rays in the prevention of tuberculosis. He used a recorded communication and colored slides as the distraction. The significant data demonstrated convincingly that moderate distraction facilitates persuasion, and also gave some support to his hypothesis that moderate distraction produces more persuasion than strong distraction.

In general, the distraction hypothesis has been supported. It is now appropriate to turn to a fuller investigation of variables effecting distraction and the resulting attitude change. In the distraction experiment, if the distraction stimuli were excluded from the subject's attention and his concentration focused on the communication, he should be better able

to counterargue the points made more effectively than a distracted subject. According to the distraction hypothesis, little attitude change is expected as compared to that expected for the distracted subject. One way in which this focusing of attention may be achieved is by arousal. Arousal refers to the excitation of the individual as a whole. It may be defined as the extent of release of potential energy, stored in the tissues of the organism, as this is shown in activity or response (Duffy, 1962).

It has been repeatedly demonstrated that the number of environmental cues which an organism observes, maintains an orientation towards, responds to, or associates with a response decreases with an increase in emotion. Relevant studies were reviewed by Easterbrook (1959). More recently, studies by Krausler & Trapp (1960); Eysenck & Willet (1962); and Leedy (1963) have lent support to the hypothesis. Easterbrook pointed out that in situations where an individual is working on a central task, surrounded by stimuli irrelevant to the task, a reduction in cue utilization seems to improve performance. The irrelevant cues are excluded and full attention is given to relevant cues.

Based on the work relating arousal and cue utilization, it is suggested that the distractability of a subject in the distraction experiment decreases with increases in arousal. If reading the communication is made the central task, a highly aroused subject's attention is more or less restricted to that communication: the distraction has little effect. As a result, he counterargues more effectively, and is less susceptible to persuasion. On the other hand, the non-aroused subject's attention is not restricted to the communication. His attention is divided between the communication and

the distraction. As a result, he is not as able to counterargue effectively, and is more susceptible to persuasion than the aroused subjects.

To test this hypothesis, an aroused group was compared to a non-aroused group in the distraction experiment. Arousal was induced by failure on a task. The subjects were required to read a written communication, advocating a position opposed to their own, in a highly distracting situation. The degree of distraction and corresponding attitude change of the two groups were compared. It was expected that as arousal increases, the attention given the distraction stimuli decreases; attention given to the communication increases; and the degree of attitude change decreases.

Method

Subjects

At the beginning of the term, all introductory psychology students were given a "current Problems" questionnaire, along with a number of other questionnaires irrelevant to the present study. The questionnaire consisted of a description of four problems, a statement indicating a particular position on each problem, and an eleven point scale on which the subject was to indicate the degree to which he agreed or disagreed with that position. The subject was also required to indicate his certainty, in terms of percent, that his opinion would not change in the next year. Subjects were selected who rated their opinion concerning the use of television as a teaching aid in high schools as low negative on the questionnaire: position 3 or 4 on the eleven point scale. From these, sixty subjects who estimated the probability of no change in their position in the next year as being between 50 and 80% were used. This procedure was to insure that the subjects did not hold extreme attitudes toward the "T.V. in High Schools" topic, yet were reasonably committed to their position. Twenty-six males and thirty-four females took part in the experiment as part of their course requirements.

Apparatus and Materials

The Current Problems Questionnaire. This consisted of a description of four problems each with the scales previously discussed. The four problems were: (1) whether residential areas should be destroyed to allow

for University expansion; (2) whether departmental exams should be retained in high schools; (3) whether the Beatles, a popular singing group, should have been honored by being made "members of the British Empire"; and (4) whether television should be used as a teaching aid in high schools. The "television in high schools" problem was selected for the experiment for the following reasons: first, there were more subjects who met the criteria for selection on this topic, than on the others; and secondly, this topic was of a less controversial nature than the others. The current problems questionnaire is contained in Appendix A.

The Communication. The communication was a three page, double spaced, typed essay. It was a one-sided argument advocating the use of television as a teaching aid in high schools, a position opposed to that of the subjects used in the experiment. Appendix B contains the communication.

Retention Test for the Communication. The test consisted of twenty-two short answer questions intended to test the subject's knowledge of the content of the communication. Appendix C contains the retention test for the communication.

The Distraction. The distraction was provided by a tape recording of twenty-two different sound effects, each lasting approximately fifteen seconds. The sound effects included: a steam boat whistle, a train, a race car, a telephone being dialed, a car being started, people laughing, a telephone ringing, music, water being poured, a telephone busy tone, a fire engine, a glass being broken, morse code, a typewriter, a jet aircraft, a bird singing, hammering, an electric saw, a bottle of soda-pop being opened, a Chinese gong, a downtown traffic intersection, and a bull fight.

Retention Test for the Distraction. The retention test consisted of twenty-two blanks on which the subjects were to write down the sound effect they could remember. See Appendix D for an example of this test.

Arousal apparatus. Arousal was induced by failure on a task; the task was the solution of a stylus maze. Each of three identical stylus mazes was altered so as to be insoluble. Each was fitted with an interlocking stylus which could not be removed accidentally.

Work Space. A double level table was partitioned into three sections, one for each subject. Each section of the lower level, 24 ins. off floor level, was fitted with a maze. The upper level, 7 ins. directly above the lower level, was utilized as a general work area, on which the subjects could do the paper work. The upper level prevented the subjects from viewing the mazes on the lower level.

Heart rate was utilized as an indication of arousal since it has been demonstrated that it is one of the more adequate single measures of arousal (Schnore, 1959). It was also chosen for the practical reason that readings could be taken without disturbing the subject. A Sanborn Model 51 Viso-cardiette was fitted with three sets of electrodes in order to handle three subjects. Two electrodes were attached to the right forearm, and one was attached to the left forearm of each subject. A printed record of heart rate was provided.

Procedure

Subjects were run in twenty groups of three each. They were brought into the experimental room and seated at the specially designed table.

Sliding partitions were then moved into place, excluding the subjects from one another's view. The three cardiograph electrodes were then attached to each subject. The experimenter told the subjects that the apparatus needed time to warm up, and the subjects were left sitting for a period of five minutes, for stabilization to occur. After this period, a base heart rate was taken for each subject. Each reading was taken for a period of 15 seconds. Due to the design of the apparatus, it was possible to take a reading from only one subject at a time. It was necessary to take the heart rate readings for the three subjects one after another. Time required for switching from subject to subject was approximately 1 sec.

The subjects were then informed that they were to take part in an experiment intended to study physiological changes occurring during an intelligence test. To do this, they were told that they would be given an intelligence test consisting of two tasks, a perceptual-motor task and a memory task; and that physiological measures would be taken via the electrodes during the test. It was made clear that the process would be completely painless. It was further explained that for the perceptual-motor task, they would be required to solve a difficult maze; and that for the memory task, they would be given an essay to read (actually the communication) and later be tested on their memory of its content.

The subjects were shown a maze and stylus similar to the one they were to use and told that they would have to solve the maze without seeing it. It was explained that each maze was wired so that a buzzer, located beside the maze, would sound automatically when the solution had been reached. The buzzers in fact were not controlled by the solution, since

the mazes were insoluable, but were controlled by the experimenter. The subjects were told that they would have nine minutes to solve the maze, and that if they solved it before this time, they were just to relax and wait for the others to finish.

This portion of the experiment served as an arousal induction period. It was reasoned that successful rapid completion of a task results in low arousal, whereas unsuccessful or slow completion increases arousal. Whiteman (1957) supports this assumption. After a three minute period had elapsed, one of the subject's buzzers was sounded, leading him to believe that he had completed the task ahead of the others. This subject was labeled "low arousal". After another three minutes, another subject's buzzer was sounded; this subject was labeled "medium arousal". After one more three minute period, the experimenter called time. The remaining subject was not allowed to "complete" the task. He was labeled "high arousal".

While the subjects read the essay, the distraction tape was played. It was played at a level slightly louder than that required for normal listening. The distraction was completely unexpected. Ten sec. heart rate measures were taken at the 1, 3, and 5 min. points of the time allotted for the reading of the essay. This was to provide an objective measure of arousal during the period in which the subject was in contact with the communication and the distraction.

Immediately after reading the essay, the subjects were told that in order to accurately score the memory test they were about to take, it was necessary to take into account their attitudes concerning the topic of the

essay. They were given an attitude questionnaire similar to that which they were given at the beginning of the year. It included a stated position:

"Television should be used more for teaching high school."

and an eleven point scale on which they were requested to indicate the degree to which they agreed or disagreed with the statement.

They were then given the retention test for the communication. They were given six minutes to complete it. Based on the assumption that the more attention one gives to a task, the more items he can learn, the score on this task was taken as a measure of the subject's attention given to the communication. Support for this notion is provided by Tempone, Capehart & Golding (1966); Mackintosh (1966); and Sutherland (1966).

Following the communication retention test, the subjects were asked to write down as many of the sound effects as they could remember. They were also given six minutes for this task. This score was used as a measure of degree of distraction from the communication, or attention given to the distraction stimuli. The rationale involved here, is similar to that discussed for the communication retention test.

After thirty subjects had been run, the order of presentation for the communication and distraction retention tests was reversed as a control for possible order effects.

Generally, the procedure was as follows: subjects, aroused to three different levels, were given a written communication, advocating a position opposed to their own. They were distracted during the period allotted for the reading of the communication with several sound effects. Their

concentration on the communication and degree of distraction were inferred from their scores on retention tests , which tested their memory of communication and distraction stimuli. Their pre-communication attitude was compared to their post-communication attitude as a measure of attitude change.

Results

Communication Memory

The twenty-two short answer questions of the Communication Retention Test were scored in the following manner: one point was given for a correct answer, zero for an incorrect answer. The scores were expressed as the number correct out of twenty-two.

An analysis of variance indicated significant differences between the three groups in terms of the mean test scores ($F = 3.36$, $df = 2, 57$, $p < .05$). Duncan's New Multiple Range Test (Edwards, 1962) indicated that the "Low Arousal" treatment group did not differ significantly from the "Medium Arousal" treatment group. The "High Arousal" treatment group differed significantly from both the "Low" and "Medium Arousal" treatment groups, in that they remembered more of the communication ($p < .05$). Apparently there were only two levels of concentration on communication produced: one resulting from the "Low" and "Medium Arousal" treatment conditions, and one resulting from the "High Arousal" treatment condition. Table 1 indicates the means. A summary of the analysis of the communication memory data is Appendix E 1.

Distraction Memory

One point was assigned for each sound effect correctly remembered by the subject. His score was the number correctly remembered out of twenty-two. An analysis of variance indicated significant differences between the groups in terms of the number of sound effects remembered

Table 1

Mean number of communication and distraction items remembered by the Low, Medium, and High Arousal treatment groups.

Treatment Group	Communication Items	Distraction Items
Low	14.7	8.4
Medium	14.4	7.9
High	16.8	5.2

($F = 12.95$, $df = 2, 57$, $p < .01$). Duncan's test indicated that the "Low Arousal" and "Medium Arousal" treatment groups did not differ significantly. The "High Arousal" treatment group remembered significantly fewer items than the "Low" and "Medium Arousal" treatment groups ($p < .01$). Apparently only two levels of distraction were produced: one by both the "Low" and "Medium Arousal" treatments, and one by the "High Arousal" treatment. Table 1 indicates the means. The same information is interpreted in Fig. 1. A summary of the analysis of the distraction data is Appendix E 2.

Heart Rate Change

The change score was the difference between the mean of the three measures taken during the reading of the communication, and the initial base measure. An analysis of variance of the heart rate change for the three groups yielded significant results ($F = 7.62$, $df = 2, 57$, $p < .01$)¹. Duncan's test indicated that the "Low" and "Medium Arousal" treatment groups did not differ significantly in their heart rate change. The "High Arousal" treatment group evidenced an increase in heart rate significantly greater than that of either the "Low" or "Medium Arousal" treatment groups ($p < .01$). Apparently, only two levels of arousal were actually produced by the different treatments. The "Low" and "Medium Arousal" treatment groups did not differentiate and formed one group. The "High Arousal" treatment group formed the other group. Table 2 indicates the base heart

¹An analysis of co-variance performed on the base and test heart rates yielded similar results. A summary of this analysis is included in Appendix E 3.

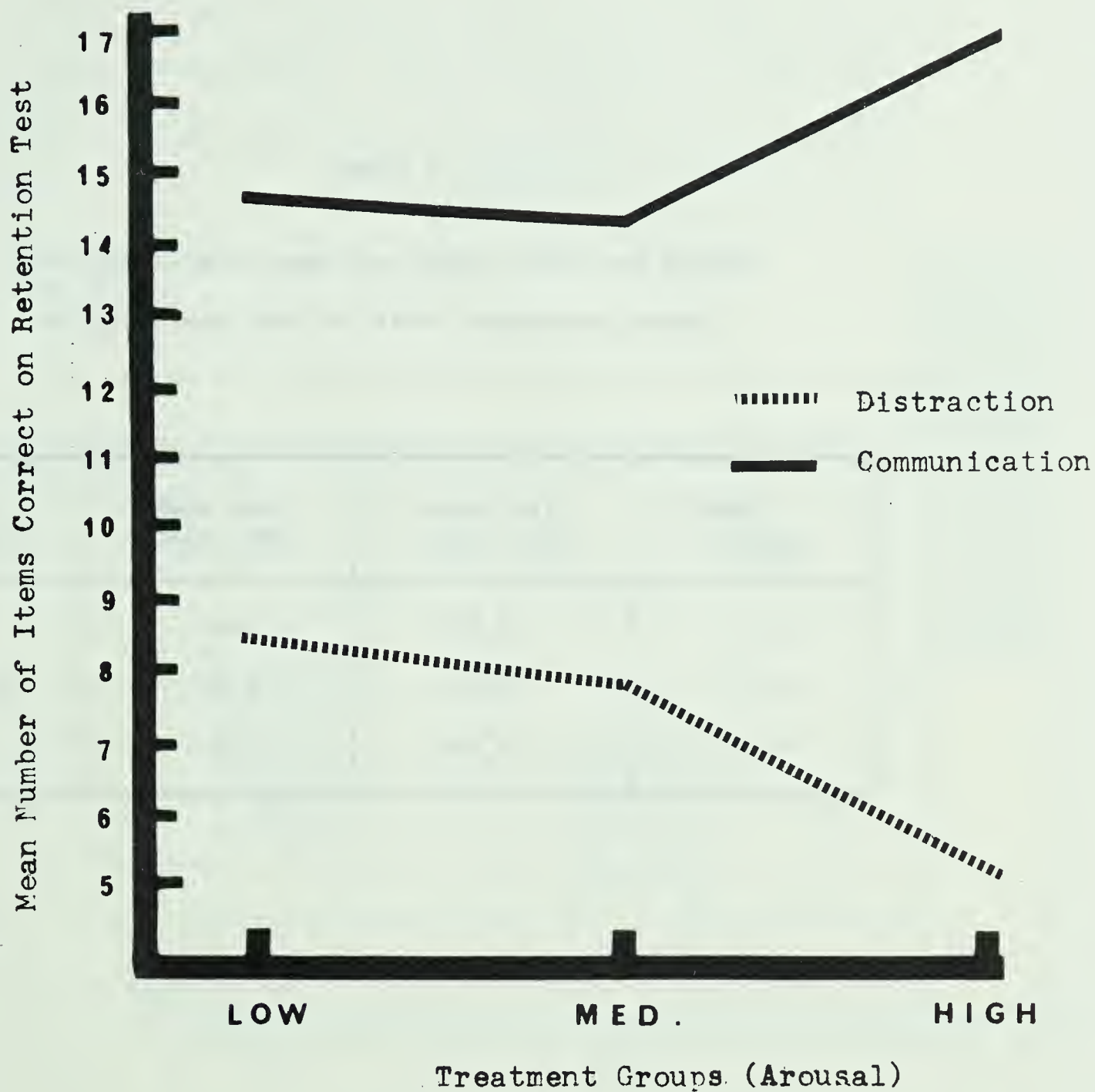


Fig. 1 Mean scores on communication and distraction retention tests for the Low, Medium, and High Arousal treatment groups.

Table 2

Base heart rate, mean test heart rate, and change
in heart rate for the three treatment groups.

Arousal Condition	Mean Base Heart Rate	Mean Test Heart Rate	Mean Increase
Low	74.6	79.8	5.2
Medium	73.6	77.9	4.3
High	79.9	90.8	10.9

rate, the mean test heart rate, and the mean change in heart rate for the three treatment conditions. The same information is interpreted graphically in Fig. 2. A summary of the analysis of heart rate data is Appendix E 3.

Attitude Change

Attitude change was measured as the difference between the precommunication attitude, taken at the beginning of the term, and the post communication attitude. An analysis of variance indicated significant differences between the three groups in terms of their attitude change ($F = 13.76$, $df = 2, 57$, $p < .01$). Again, Duncan's Multiple Range Test revealed that the "Low" and "Medium Arousal" treatment groups did not differ significantly. The "High Arousal" treatment group evidenced significantly less attitude change than both the "Low" and "Medium Arousal" treatment groups ($p < .01$). Table 3 indicates the initial attitudes, the post communication attitudes, and the attitude change for the three treatment groups. Attitude change is represented graphically in Fig. 3. A summary of the analysis of attitude data is Appendix E 4.

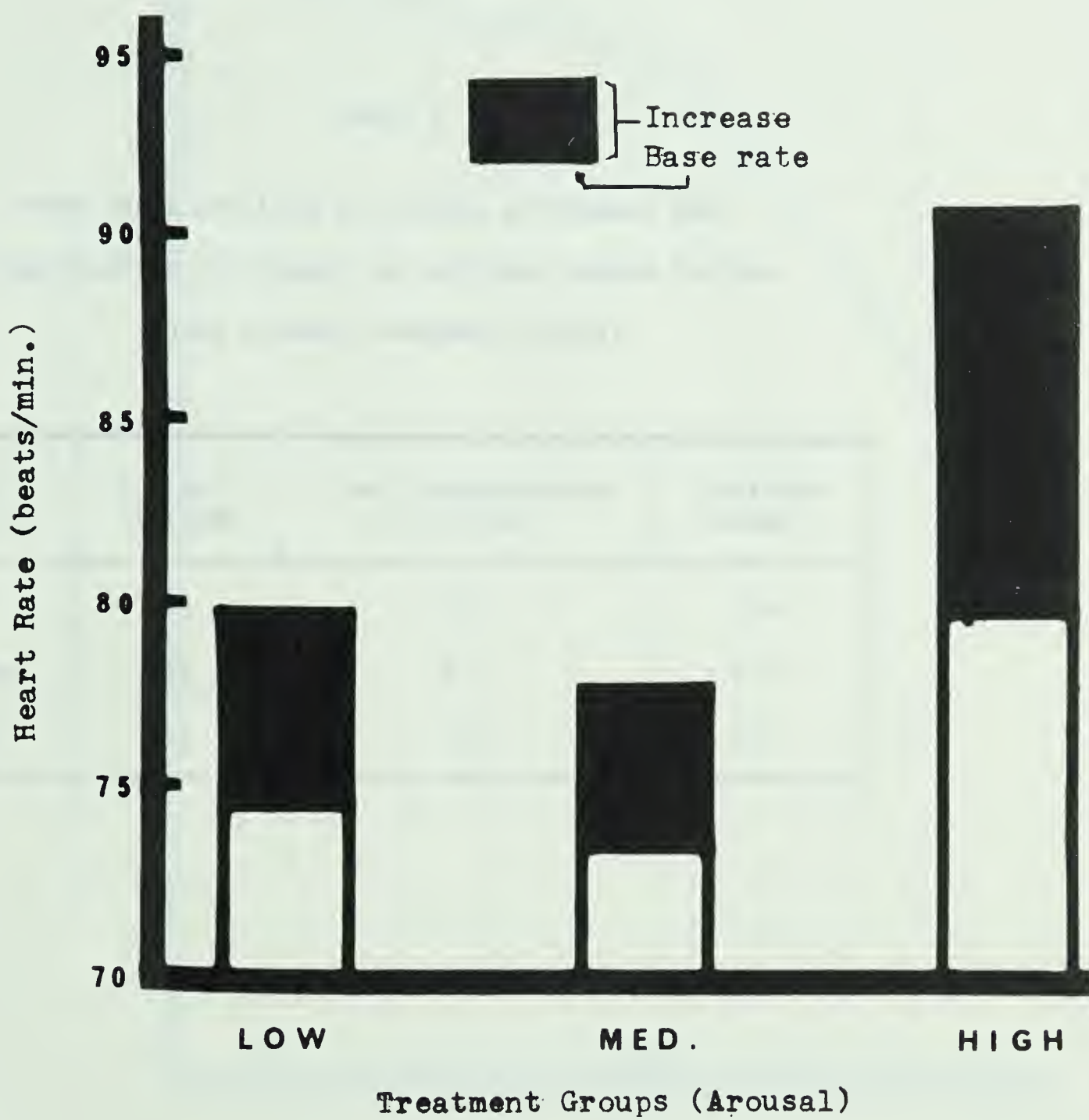


Fig. 2 Base heart rate and increase in heart rate for the Low, Medium, and High Arousal treatment groups.

Table 3

Mean Scale position of initial attitudes, post communication attitudes, and attitude change for the three arousal treatment groups.

Arousal Condition	Initial Attitude	Post Communication Attitude	Attitude Change
Low	3.3	9.2	5.9
Medium	3.1	8.7	5.6
High	3.5	6.7	3.2

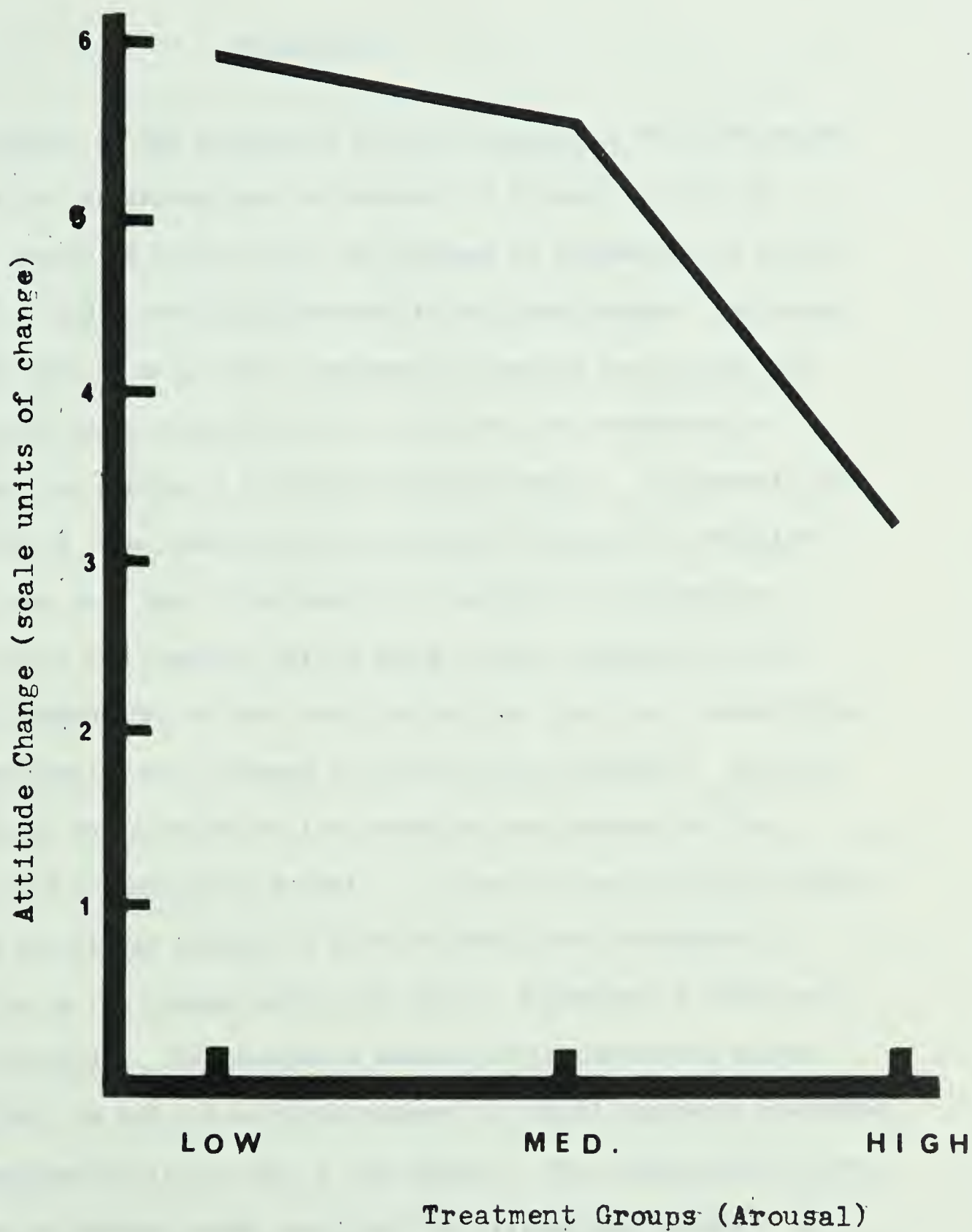


Fig. 3 Attitude change for the Low, Medium, and High Arousal treatment groups.

Discussion

The results of the study were entirely consistent with the expectations. It was predicted that an increase in arousal results in: a decrease in degree of distraction, an increase in concentration on the communication, and a resulting decrease in attitude change. The study demonstrated that as heart rate increased, retention test scores for the distraction fell, retention test scores for the communication improved, and the degree of attitude change decreased. In general, the study provided a clear indication that attitude change is a function of arousal, and that this relationship is mediated by distraction.

This study was somewhat unique among studies dealing with the distraction hypothesis, in that both distraction from, and concentration on the communication were treated as quantitative variables. An indication of these was provided by the retention test scores for the distraction and communication stimuli. In most of the previous studies, distraction was simply assumed to have occurred, and no measure of concentration on the communication was taken. Rosenblatt's study was the single exception. He involved a measure of concentration on the communication. He had his subjects attempt to recall arguments presented in the communication at the end of the session. The involvement of both measures in the present study clarified the distraction process. It demonstrated the transfer of attention from the communication to the distraction stimuli.

The procedure intended to produce three groups of subjects differing in their degree of arousal, was not successful. The results indicated that

only two levels of arousal were achieved. A question arose as to which levels were in fact produced. Heart rate increases for the intended "Low" and "Medium Arousal" groups were not significantly different, yet the common increase was significant. This seemed to indicate that there was no "Low Arousal" group: only a medium and a highly aroused group were produced. The absence of the low group probably was a result of the experimental procedure. It is possible that the procedure was sufficiently arousing as to negate the possibility of a non or low aroused group. Since only two levels of arousal were produced, it was impossible to come to any conclusion concerning the function relating arousal, distraction, and attitude change. Further research is needed to investigate the distraction and attitude change resulting from several levels of arousal.

It was noted that the groups which did not differ in respect to their degree of arousal, also did not differ in their degree of distraction, concentration on the communication, or degree of attitude change. This in itself lent a good deal of support to the idea that the relationship between arousal and attitude change is mediated by distraction.

Several other problems worthy of investigation were suggested by the results of this study. One subject was inadvertently run twice. Since the experimenter was aware of this problem, upon the subject's arrival to the second session, a deviation from the usual procedure was made. Between the time of the beginning of the study and the session in question, a newspaper article was published which discussed the pros and cons of using T.V. as a teaching aid. Upon the arrival of the subjects, the experimenter

administered an attitude questionnaire, to determine whether or not the article had altered their attitudes. A comparison of these attitudes with their original attitudes revealed no change. The data for the subject who was run twice revealed that during the first session his attitude was changed seven points on the scale, from position 3 to position 10. However, at the beginning of the second session in which he took part, his attitude had returned to position 4. His original attitude had more or less recovered. Obviously, at least in one case, the attitude change resulting from the distraction procedure was not permanent. The relative permanence of attitudes gained under different circumstances is a problem worthy of investigation. It is suggested that in the present case, the subject who was prevented from counterarguing the points made during the experimental session, did so later; and as a result, retreated to his original attitude. The case might be different where the subject is allowed to counterargue and changes his attitude simply because the arguments presented in the communication were superior to his own.

The findings of the present study cannot as yet be accepted too generally. It must be remembered that it was limited in that only individuals holding low negative attitudes were used as subjects; there was no control of the availability of counterarguments; and, the only change attempted was in a positive direction. Further research is needed to investigate these matters more fully.

In a discussion of susceptibility to social influence, Walters & Park (1964) considered the relationship between arousal and social influence. They stated that the restriction of cues, resulting from arousal, could result

in a focusing of attention on a social model. They suggested that this leads to increased possibilities for channeling a percipient's behavior in a specific direction: that directed by the model. There is no data presented, however, to support such an interpretation.

Their approach seems to ignore any cognitive behavior aside from imitation. The findings of the present study suggest that as the subject's attention is narrowed, the degree to which he reasons with the cues attended to, is increased. It was suggested that if the communication suggests behavior which is dissonance producing, an effort is made to counterargue the points made. The present results demonstrate that in the case of a written communication, there is a reduction of influence.

It is not unreasonable to expect similar results in the case in which a live model replaces the written communication. If the model's behavior is dissonance producing, it is expected that an increase in arousal results in a decrease of the influence exerted by the model. Walter's & Park's interpretation would be expected to be valid only if the model's behavior was not dissonance producing.

Since arousal and distraction are constantly present in the world outside the laboratory, an understanding of their role in social influence may be a great aid to the understanding of many social behaviors.

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A P P E N D I C E S

APPENDIX A

Name _____

Current Problems Questionnaire

We are interested in attitudes regarding several current issues. Please read the description of each problem and the numbered statement which indicates a particular position on the problem. Decide if you agree or disagree with the numbered statement by placing X in the appropriate box. Please do not place "X" on the vertical lines. Also indicate how confident you are that your opinion will not change (0% - not sure, 50% - moderately sure, 100% - very sure).

EXAMPLE

All cats should be kept on leashes.

Strongly disagree 1 2 3 4 5 6 7 8 9 10 11 Strongly agree

		X									
--	--	---	--	--	--	--	--	--	--	--	--

I am 80% sure that my position will not change in the next year.

At the present time university officials are faced with a serious problem. The campus has very little unused land which is available for expansion. There are two possible solutions to this problem. It has been suggested that portions of the campus be relocated. This would mean that the campus would be divided into two portions which would be separated by a number of miles. The other possible solution is that of acquiring more land in the vicinity of the present campus. This would require the destruction of portions of what is now the Garneau residential area, one of the oldest and most historical areas in Edmonton.

1. Acquiring the Garneau area is the best solution.

Strongly disagree 1 2 3 4 5 6 7 8 9 10 11 Strongly agree

--	--	--	--	--	--	--	--	--	--	--	--

I am ____% sure that my position will not change within the next year.

There is a question as to whether departmental exams are necessary for grade twelve students. At the present time, these exams serve a dual purpose: they serve as final exams for grade twelve and as entrance exams for university. It is questioned why all students should be required to take them whether or not they intend to continue on to university. On the other hand, some feel that they are necessary to provide a uniform measure as to how the student stands in relation to all other grade twelve students in a similar pattern.

2. Departmental exams should be retained.

Strongly disagree 1 2 3 4 5 6 7 8 9 10 11 Strongly agree

--	--	--	--	--	--	--	--	--	--	--	--

I am ____% sure that my position will not change within the next year.

over

In July of this year, it was announced that the Queen had presented the Beatles, a popular singing group, the M.B.E. This award is usually awarded to persons whom the Queen feels have provided a great service to their country. Many persons think, that by presenting such an award to the Beatles, the Queen has cheapened it. As a result, many statesmen, authors, servicemen, and others, who had previously received the award have returned it. Those favoring the award, argue that the Beatles did provide a service for their country in the form of the boost that their record sales gave to the morale of the English youth.

3. The Beatles deserve the award given to them.

Strongly disagree 1 2 3 4 5 6 7 8 9 10 11 Strongly agree

--	--	--	--	--	--	--	--	--	--	--	--

I am ____% sure that my position will not change within the next year.

It has been suggested that high schools make more use of closed circuit television for teaching. With television, classes would be taught more uniformly. Also fewer, thus probably better facilities would be used. Those who object feel that individual student attention would suffer.

4. Television should be used more for teaching high school.

Strongly disagree 1 2 3 4 5 6 7 8 9 10 11 Strongly agree

--	--	--	--	--	--	--	--	--	--	--	--

I am ____% sure that my position will not change within the next year.

APPENDIX B

T.V. or not T.V. --- That is the question!

It has been questioned for some time now, whether or not T.V. should be used as a teaching aid in high schools. The opinion of this writer is an emphatic yes: certainly television should be used. As far as I can see, there are nothing but advantages to be gained from such a move. T.V. would provide benefits for both staff and student. These benefits could be considered in four categories: as a solution to the staff problem, as an aid to the presentation of materials, as a solution to the problem of inadequate facilities, and as a direct benefit to the student in terms of learning.

The use of T.V. would solve a major problem that plagues most schools today: that of an insufficient supply of trained teaching staff. At the present time, it is estimated that the secondary school system is existing with 75% of the number of teachers it needs to function effectively. As a result, the school system has been forced to hire teachers who are really unqualified to do the job.

In order to appreciate the effect that the introduction of T.V. would have, it is necessary to understand the problem: why the shortage? It is not that there is a shortage of training facilities; rather there is a shortage of people to train. It seems that university students just aren't interested. There are two reasons for this lack of interest. To begin with, one could hardly say that the teaching profession is preceived as an interesting profession for the educated person. Teachers are

constantly complaining about the dull repetition demanded with the present system. It is estimated that the average teacher repeats each lesson six times in a row. Secondly, the pay rate for teachers leaves much to be desired. Teachers earn approximately 30% less than other professionals with the same number of "training years". To increase their pay to "standard" would be a terrific load on the taxpayer.

Television could offer a solution to both of these problems. With the aid of T.V., the dull repetition now required could be completely avoided since lectures could be videotaped and replayed an infinite number of times. With T.V. fewer staff members would be needed: $\frac{1}{3}$ of the present number. As a result, the income of the educationalist could be raised substantially. The combined effect of a more interesting job, and higher pay, would draw more qualified people into the profession; and since fewer staff would be needed, only the best would be chosen. The overall result would be staff far superior to that which we see today.

In most modern high schools, the facilities are simply not sufficient for the number of students attending the school. Furthermore, it is not practical to keep enlarging present facilities to meet the demand. What is practical is a more efficient use of the facilities than is presently made. With the use of television, facilities originally restricted to small groups could be used to an advantage by large groups. For example, under the present system, a demonstration room for a physics or chemistry class can be designed to hold only approximately 60 persons still affording each a reasonable view. With television, this restriction no longer applies. The number of persons would be limited only by the size and number of T.V.

screens. Screens are now in production which can effectively handle 50 people.

Facilities not present in the schools could be brought in via the television camera. For example the operation of a nuclear reactor.

Television would be a great aid in the presentation of material. It would allow for demonstrations not possible without it. For example, closeups of dissections which previously could have been viewed by only 3 or 4 people could be viewed by many more if it were televised. Demonstrations involving conditions as it is only plausible to perform once could be taped and used over and over.

Presentation would generally be improved. It could be rehearsed and condensed -- much of the needless side-line discussion would be avoided. As a result, the same amount of information could be presented in 65% of the time now necessary.

Television would provide a system in which uniform presentation would be possible. This would be ideal for grade 12, where the exams are uniform, even though the teaching varies a great deal.

The student would profit greatly if T.V. were used in the high school. Material would be learned more easily than with the traditional system. It has been shown that learning depends upon interest: that is, the more interesting the material is, the easier it will be learned. With television, the material could be made much more interesting. Simultaneous demonstrations and the use of props such as music would all add to the general appeal.

It has also been demonstrated that when information is presented in two sense modalities simultaneously, it is learned more efficiently than when it is presented in only one. With visual and auditory presentation, the student would find the material easier to understand and learn.

A further direct advantage to the student is that he would be adapted to the lecture system before entering university. It is estimated that 35% of the university failures are due to the rapid transition from teaching to lecture systems. Experimental work has demonstrated that such failures are cut to 1/5 of the previous rate with pre-adaptation in the high school.

In general, I conclude, that the use of television in high schools would be highly advantageous. Delaying its wide scale introduction is costing everyone a great deal.

APPENDIX C

Name _____

MEMORY TEST

The following questions have been drawn from the material in the essay you have just read. Answer as many as you can.

1. What proportion of staff is there in terms of the demand for trained school teachers?

2. Give two reasons why there are not enough teachers being turned out.

3. In terms of pay, what is the status of teachers in terms of other professions requiring an equivalent training period (answer in terms of %).

4. With the use of T.V., the need for teachers would be reduced. What proportion of the present number would be needed.

5. The material taught in schools today is approximately how many years behind time?

6. Under the present system, demonstration rooms can only handle approximately _____ persons.

7. If T.V. were used, the only restriction on number of students each demonstration room could handle would be in terms of:
- a. _____
- b. _____
8. In the article, how many people was it suggested could effectively see the dissection mentioned without the use of T.V.?
- _____
9. T.V. screens are in production now which can effectively handle how many people?
- _____
10. It was suggested that demonstrations could be made in facilities not present in schools. What was the example given?
- _____
11. The use of T.V. would have a special advantage to which grade?
- _____
- What is this special advantage?
- _____
12. What percentage of university failures are due to the transition from teaching to lecture methods?
- _____
13. Research has shown that this rate can be reduced by pre-adaptation to the lecture system.
- What proportion is the failure rate with pre-adaptation as compared to the rate without pre-adapation?
- _____

14. It has been suggested that information could be presented in less time than is now necessary if it were done so more effectively. The article suggested that information could be presented in ? % of the time now necessary.
- _____
15. It was suggested that lectures could be made more interesting. Give two methods suggested in the paper.
- a. _____
- b. _____
16. It was also suggested that the material could be learned more effectively than it is under the present system. Why?
- (1) _____
- (2) _____
17. How many times does the average teacher repeat a given lesson?
- _____

During the reading task, a number of sound effects were played. Please list as many as you can remember.

[illegible]

APPENDIX E

1. Analysis of Communication Memory Data

Summary of Analysis of Variance

Source of Variance	Sum of Square	df	Mean Square	F
Between	67.24	2	33.62	3.36*
Within	570.50	57	10.01	
Total	637.74	59		

*Significant at .05 level

Duncan's New Multiple Range Test¹

	Med.	Low	High	Smallest Sig. difference at .05 level
	14.35	14.70	16.75	
Med. 14.35		.35	2.40	R ₃ 2.106
Low 14.70			2.10	R ₂ 2.002
High 16.75				
	<u>Low</u>	<u>Med.</u>	High	

Groups underscored by same line do not differ significantly

¹Duncan's New Multiple Range test follows Edwards (1962)

Appendix E (Continued)

2. Analysis of Distraction Data

Summary of Analysis of Variance

Source of Variance	Sum of Square	df	Mean Square	F
Between	113.18	2	56.69	12.95*
Within	249.15	57	4.37	
Total	362.33	59		

*Significant at the .01 level.

Duncan's New Multiple Range Test

	High	Med.	Low	Smallest Sig. difference at .01 level
High	5.20	7.85	8.40	
Med.		2.55	3.20	R ₃ 1.866
Low			0.55	R ₂ 1.759
	Low	Med.	High	

Appendix E (Continued)

3. Analysis of Heart Rate Data

Summary of Analysis of Variance of Heart Rate Change

Source of Variance	Sum of Squares	df	Mean Square	F
Between	520.17	2	260.06	7.62*
Within	1944.45	57	34.11	
Total	2464.62	59		

*Significant at the .01 level

Duncan's New Multiple Range Test. Heart Rate Change.

	Med.	Low	High	Smallest Sig. Difference at .01 level.
	4.33	5.13	10.94	
Med. 4.33		.08	6.61	R ₃ 5.122
Low 5.13			5.81	R ₂ 4.913
High 10.94				

Med. Low High

Variances for the Low, Medium, and High Arousal
Treatment Groups: Base and Mean Test Heart Rate.

Group	Base Variance	Mean Test Variance
Low	140.6	112.85
Medium	197.11	213.77
High	73.3	107.26

Appendix E (Continued)

Summary of Analysis of Co-Variance for Base and Test Heart Rate.¹

Differences between the groups regression coefficients

Source of Variance	Sum of Squares	df	Mean Square	F
S ₃	81.45	2	40.73	1.26
S ₁	1743.43	54	30.28	

p > .05

Test of Significance for the treatment means

Source of Variance	Sum of Squares	df	Mean Square	F
S ₅	598.44	2	299.22	9.18*
S ₂	1824.88	56	32.59	
S ₄	2423.32	58		

*Significant at the .01 level

¹Analysis of Co-Variance follows Edwards (1962)

Appendix E (Continued)

Adjusted Means for Mean Test Heart Rate

Arousal Group	Mean
Low	81.0
Medium	79.9
High	87.3

Appendix E (Continued)

4. Analysis of Attitude Change Data

Summary of Analysis of Variance of Attitude Change

Source of Variance	Sum of Squares	df	Mean Square	F
Between	90.53	2	45.26	13.76*
Within	187.65	57	3.29	
Total	278.18	59		

*Significant at the .01 level

Duncan's New Multiple Range Test. Attitude Change

	High	Med.	Low	Smallest Sig. Difference at .01 level
	3.75	5.65	5.85	
High 3.75		2.40	2.70	R_3 1.591
Med. 5.65			0.30	R_2 1.526
Low 5.85				
	High	Med.	Low	
	<hr/>			

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